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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,806	12/13/2006	Mario Gerla	51990/JEC/R268	3983
23363 7590 01/24/2008 CHRISTIE, PARKER & HALE, LLP PO BOX 7068 PASADENA, CA 91109-7068			EXAMINER ELPENORD, CANDAL	
			ART UNIT 2616	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/550,806

Applicant(s)

GERLA ET AL.

Examiner

Candal Elpenord

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :31 JULy 2007, 20 August 2007, 14 September 2007.

DETAILED ACTION

Abstract Objection

1. The abstract of the disclosure is objected to because the phrase "improved data transmission" is improper language. Correction is required. See MPEP § 608.01(b).
2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

3. Claim 10 is objected to because of the following informalities: It is suggested to applicant to change "he" to -the-.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 11-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

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Regarding claim 11, the limitation “memory having program instructions” is not a process, machine, manufacturer, or composition of matter, or any new and useful improvement thereof because there is no physical structure/connection of computer software recited in the claim. To overcome this rejection, it is suggested to applicant to change “program instructions” to—a computer readable medium encoded with computer executable instructions--.

Similar problems exist for claims 12-20.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 1-3, 5-10, 11-13, 15-20** are rejected under 35 U.S.C. 102(e) as being anticipated by Bergsson et al (US 2002/0071388 A1).

Regarding claim 1, Bergsson et al (US 2002/0071388 A1) discloses a method (“method for facilitating packet communications between transmitting terminal and receiving terminal”, recited in paragraph 0017, lines 3-8) of controlling (“adjust the rate of the transmission”, recited in paragraph 0017, lines 3-8) a data transmission session (“communications session”, recited in paragraph 0029) by a sender (“sending terminal”, recited in paragraph 0017,

lines 3-8) to a receiver ("receiving terminal", recited in paragraph 0017, lines 3-8) over a communications network ("packet data switched network", recited in paragraph 0035) comprising: receiving by the sender ("sending terminal", recited in paragraph 0017, lines 3-8) from the receiver ("receiving terminal", recited in paragraph 0017, lines 3-8) via the communications network ("packet data switched network", recited in paragraph 0035) a plurality of data transmission acknowledgements ("messages acknowledgement packet receipt to calculate throughput rate", recited in paragraph 0023); generating by the sender ("sending terminal", recited in paragraph 0017, lines 3-8) a first connection rate estimate ("throughput rate", recited in paragraph 0018) of network share using the plurality of acknowledgements ("messages acknowledgement packet receipt to calculate throughput rate", recited in paragraph 0023); and setting by the sender ("sending terminal", recited in paragraph 0017, lines 3-8) a data transmission control parameter ("congestion windows", recited in paragraph 0018) using the first connection rate estimate ("throughput rate", recited in paragraph 0018).

Regarding claim 2, 12, Bergsson et al (US 2002/0071388 A1) the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8), wherein generating ("calculation of throughput rate", recited in paragraph 0023) by the sender ("sending terminal", recited in paragraph 0017, lines 3-8) of a connection rate estimate ("messages acknowledgement packet receipt to calculate throughput rate", recited in paragraph 0023) further comprises: generating a rate sample ("using a first and second sets of packets to calculate multiple

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throughputs", recited in paragraph 0032) when an acknowledgement arrives using information in the acknowledgement regarding an amount of data ("the number of bits in each packet", recited in paragraph 0032, lines 1-25) received by the receiver data and an acknowledgement inter-arrival time ("updated round-trip-time obtained each time an acknowledgement packet is received", recited in 0035); and exponentially averaging the rate sample ("average calculation", recited in paragraph 0032, lines 6-25) with a previous rate sample to produce smoothed rate estimate ("using plurality sets of packets to provide a smooth function", recited in paragraph 0032, lines 10-25) using a filter ("using the leaky bucket to adjust the congestion window", recited in paragraph 0022-the leaky bucket algorithm plays the same role as that of the instant application) with time varying coefficients ("updating the RTT/Round Trip-Time each time packet is received", recited in paragraph 0035).

Regarding claim 3, 13, Bergsson et al (US 2002/0071388 A1) discloses the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8), further comprising generating a second connection rate estimate ("calculation of throughput rate of change", recited in paragraph 0019) by the sender ("sending terminal", recited in paragraph 0017, lines 3-8); determining by the sender ("sending terminal", recited in paragraph 0017, lines 3-8) a cause of packet loss ("unacknowledged data transmission in bytes", recited in paragraph 0036) using the first connection rate estimate ("calculated throughput rate", recited in

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paragraph 0019) and the second connection rate estimate ("calculation of throughput rate of change", recited in paragraph 0019); and setting by the sender a congestion window ("the transmitting terminal utilizes two different estimates to calculate two different estimated congestion windows", recited in paragraph 0018, lines 3-12) and a slow start ("slow down in the throughput rate", recited in paragraph 0037) threshold control parameter ("calculation of congestion window due to the rate of change of the throughput", recited in paragraph 0036) using the determination of the cause of packet loss ("unacknowledged data transmission in bytes", recited in paragraph 0036).

Regarding claim 5, 15, Bergsson et al (US 2002/0071388 A1) discloses the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8), wherein the first connection rate estimate ("calculated throughput rate", recited in paragraph 0019) is a bandwidth estimate ("estimated the length round-trip pipe", recited in paragraph 0018, lines 2-8) the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8) further comprising: generating a plurality of bandwidth samples ("calculated pipe lengths", recited in paragraph 0039) using acknowledgement pairs ("transmitting and receiving acknowledgement", recited in paragraph 0039) taken from the plurality of acknowledgements; and generating the bandwidth estimate ("second of the calculated pipe length", recited in paragraph 0040) using a low pass filter ("change in the congestion

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window size", recited in paragraph 0040) and the plurality of bandwidth samples ("calculated pipe lengths", recited in paragraph 0039).

Regarding claim 6, 16, Bergsson et al (US 2002/0071388 A1) discloses the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8), wherein the first connection rate estimate ("calculated throughput rate", recited in paragraph 0019) is a rate estimate ("calculated throughput being applied to a transmission rate", recited in paragraph 0023, lines 6-9), the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8) further comprising: generating a plurality of rate estimates using amounts of data acknowledged ("calculations based upon messages that acknowledge receipt of transmitted packets", recited in abstract, lines 10-14) during sampled time intervals ("the total time and the time of receipt of each packet", recited in paragraph 0030, lines 6-9, paragraph 0032, lines 6-8); and generating the rate estimate ("throughput calculations", recited in paragraph 0032, lines 10-25). by applying a low pass filter ("sliding window model", recited in paragraph 0032, lines 6-12) to the plurality of rate estimates ("throughput calculations", recited in paragraph 0032, lines 10-25).

Regarding claim 7, 17 Bergsson et al. discloses the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8), further comprising adapting the

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sampled time intervals ("each time of receipt of a packet", recited in paragraph 0032, lines 6-9, "round trip time", recited in paragraph 0035, lines 3-11) using a perceived network congestion level ("calculation of potential congestion widows which account for worst case congestion window", recited in paragraph 0023), the perceived congestion ("calculation of potential congestion widows which account for worst case congestion window", recited in paragraph 0023) level determined from a difference between an expected throughput ("present state of rate change of the system", recited in paragraph 0042) and an achieved throughput of data ("present state of the system", recited in paragraph 0023) from the sender ("sending terminal", recited in paragraph 0017, lines 3-8) to the receiver ("receiving terminal", recited in paragraph 0017, lines 3-8).

Regarding claim 8,18 Bergsson et al. discloses the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8), further comprising setting the congestion window ("new congestion window from the estimated congestion windows", recited in paragraph 0018, lines 8-12) and the slow start threshold ("predetermined value", recited in paragraph 0046, lines 9-14) during startup of a connection (fig. 2, Start of communications session", recited in paragraph 0029, lines 3-7, paragraph 0030, lines 8-12) between the sender ("sending terminal", recited in paragraph 0017, lines 3-8) and the receiver ("receiving terminal", recited in paragraph 0017, lines 3-8) over the communications network

("communications session over a packet switched data network", recited in paragraph 0029, lines 3-7).

Regarding claim 9, 19, Bergsson et al (US 2002/0071388 A1) discloses the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8), wherein the data transmission session ("communications session", recited in paragraph 0029, lines 3-7) is for video data, the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8) further comprising: establishing a data connection (fig. 2, "full-duplex communications session where both parties are communicating", recited in paragraph 0029, lines 3-13) between the sender ("sending terminal", recited in paragraph 0017, lines 3-8) and the receiver ("receiving terminal", recited in paragraph 0017, lines 3-8) via the communications network ("communications session over a packet switched data network", recited in paragraph 0029, lines 3-7); establishing a data control connection ("Transmission Control protocol or TCP", recited in paragraph 0034) between the sender ("sending terminal", recited in paragraph 0017, lines 3-8) and the receiver ("receiving terminal", recited in paragraph 0017, lines 3-8); transmitting by the sender ("sending terminal", recited in paragraph 0017, lines 3-8) to the receiver ("receiving terminal", recited in paragraph 0017, lines 3-8) video data via the data connection ("communications session", recited in paragraph 0029, lines 3-7, paragraph 0030); and receiving ("throughput transmitted back to the

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transmitter", recited in paragraph 0034) by the sender ("sending terminal", recited in paragraph 0017, lines 3-8) from the receiver ("receiving terminal", recited in paragraph 0017, lines 3-8) the acknowledgements via data control connection ("acknowledgement of packet with respect to Transmission Control Protocol or TCP", recited in paragraph 0034).

Regarding claim 10, Bergsson et al (US 2002/0071388 A1) discloses the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8), wherein the acknowledgements include data control packets ("acknowledgement of packet with respect to Transmission Control Protocol or TCP", recited in paragraph 0034), the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8) further comprising: determining by the sender ("sending terminal", recited in paragraph 0017, lines 3-8) a bandwidth estimate using the data control packets; and altering ("updated of the calculated throughput rate", recited in paragraph 0044, lines 13-29) by the sender ("sending terminal", recited in paragraph 0017, lines 3-8) a data transmission rate ("updated of throughput rate", recited in paragraph 0044, lines 13-29) and a bit rate of the transmitted video data ("number of bits in each packet", recited in paragraph 0032, lines 3-12).

Regarding claim 11, Bergsson et al (US 2002/0071388 A1) discloses a data processing apparatus for controlling ("adjust the rate of the transmission",

recited in paragraph 0017, lines 3-8) a data transmission session (“communications session”, recited in paragraph 0029) by a sender (“sending terminal”, recited in paragraph 0017, lines 3-8) to a receiver (“receiving terminal”, recited in paragraph 0017, lines 3-8) over a communications network (“packet data switched network”, recited in paragraph 0035), comprising: a processor (fig. 2, Calculate Throughput 204, recited in paragraph 0031, “calculated throughput rate comprises a processor”, recited in page 4, paragraph 0047, lines 18-22); and a memory (“memory of the transmitting terminal”, recited in paragraph 0035, lines 1-7, fig. 3, Flow Chart) coupled to the processor (“calculated throughput rate comprises a processor”, recited in page 4, paragraph 0047, lines 18-22), the memory having program instructions executable (“program capable of determining”, recited in paragraph 0023, lines 1-5) by the processor stored therein (“calculated throughput rate comprises a processor”, recited in page 4, paragraph 0047, lines 18-22), the program instructions (“program capable of determining”, recited in paragraph 0023, lines 1-5) comprising: receiving by the sender (“sending terminal”, recited in paragraph 0017, lines 3-8) from the receiver (“receiving terminal”, recited in paragraph 0017, lines 3-8) via the communications network (“packet data switched network”, recited in paragraph 0035) a plurality of data transmission acknowledgements (“messages acknowledgement packet receipt to calculate throughput rate”, recited in paragraph 0023); generating by the sender (“transmitting agent/sending terminal calculate throughput from messages acknowledging packet receipt”, recited in paragraph 0023) a first connection rate estimate (“calculated throughput rate”,

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recited in paragraph 0023, lines 4-9) of network share using the plurality of acknowledgements ("messages acknowledging receipt of packet", recited in paragraph 0023) and setting by the sender ("sending terminal", recited in paragraph 0017, lines 3-8) a data transmission control parameter ("congestion windows", recited in paragraph 0018) using the first connection rate estimate ("calculated throughput rate", recited in paragraph 0023, lines 4-9).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any

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inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claims 4, 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergsson et al (US 2002/0071388 A1) in view of Banerjee et al (US 2002/0122385 A1).

Regarding claim 4, 14, Bergsson et al. discloses the method ("method for facilitating packet communications between transmitting terminal and receiving terminal", recited in paragraph 0017, lines 3-8), wherein determining by the sender ("sending terminal", recited in paragraph 0017, lines 3-8) a cause of packet loss ("unacknowledged data transmission in bytes", recited in paragraph 0036). ("present state of the system", recited in paragraph 0023), ("present state of rate change of the system", recited in paragraph 0042), calculating a ratio of expected throughput ("calculated ratio of TP_n/TP_{n-1} ", recited in paragraph 0038) to achieved throughput ("throughput value at the receiver each time a packet is calculated", recited in paragraph 0038, lines 1-5).

Bergsson is silent with respect to the following features: determining the cause of packet loss to be from congestion if the ratio exceeds a threshold value, and determining the cause of packet loss to be from data transmission

errors if the ratio of expected to achieved throughput is below the threshold value.

However, Banerjee et al (US 2002/0122385 A1) in the same field of endeavor discloses: calculating a ratio of expected throughput to achieved throughput; determining the cause of packet loss (fig. 1, First Host 10, Second Host 40, "host determines if error or congestion induced losses dominate the data connection", recited in paragraph 0009, lines 1-14) to be from congestion (fig. 4, Congestion dominates then packets are handled with TCP 130) if the ratio exceeds a threshold value ("if temperament exceeds a predetermined value then reduction in TCP reduction is due to error induced losses", recited in paragraph 0017, lines 1-22, "calculation of temperament parameter 100); and determining the cause of packet loss (fig. 1, First Host 10, Second Host 40, "host determines if error or congestion induced losses dominate the data connection", recited in paragraph 0009, lines 1-14) to be from data transmission errors (fig. 2, Error Induced losses 110, then packets are handled with modified TCP 120 recited in paragraph) if the ratio of expected to achieved throughput is below the threshold value ("reduction in TCP throughput due to error induced packet losses", recited in paragraph 0016, lines 1-15, "calculation of temperament parameter 100).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the features of Bergsson et al. by using features as taught by Banerjee et al. in order to determine the cause of packet losses in a data connection (See paragraph 0010 for motivation).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Meggers et al (US 6,728,270 B1) and Brooks et al (US 6,038,606).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Candal Elpenord whose telephone number is (571) 270-3123. The examiner can normally be reached on Monday through Friday 7:30AM to 5:00PM EST.

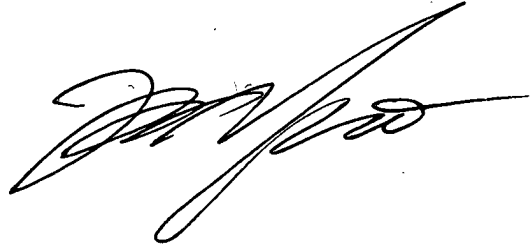
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Bin Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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CE

KWANG BIN YAO
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to be 'Kwang Bin Yao', written in a cursive style.